REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-14 and 31-40 are in the case.

I. ELECTION/RESTRICTION

The election of Group I is affirmed. Claims 15-30 and 41-47 have been canceled without prejudice.

II. SPECIFICATION

The specification has been objected to as not containing a brief description of the drawings. In response, the specification has been amended to include an appropriate heading. Withdrawal of the objection to the specification is respectfully requested.

III. THE OBVIOUSNESS REJECTION

Claims 1-14 and 31-40 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent 6,258,978 to Kitchen et al. At page 3, of the Action, it is stated that:

> "For the purposes of this rejection, the Examiner considers the limitation "the outlet stream comprises less than 2 vol% oxygen" to require that the percentage oxygen in the outlet stream be maintained at greater than 2% by reducing the alkene partial pressure."

The rejection is respectfully traversed.

The present invention as claimed provides a process for the production of an alkenyl carboxylate. The process comprises reacting an alkene, a carboxylic acid and a molecular oxygen-containing gas in a reaction zone in the presence of a catalyst at an elevated reaction temperature, T, to produce an outlet stream from the reaction zone comprising alkenyl carboxylate and oxygen. During a process upset, start-up or shut-down, when the catalyst is contacted with the alkene, at a partial pressure, P, optionally in the presence of the carboxylic acid, and the outlet stream comprises less than 2vol% oxygen, the partial pressure of the alkene is reduced and/or the reaction temperature is reduced so as to suppress formation of benzene and/or suppress inhibition of the catalyst.

As noted in the application as filed, it has been found that when catalysts suitable for use in the production of alkenyl carboxylates, such as vinyl acetate, are exposed to alkene in the absence or substantial absence of molecular oxygen, the catalyst shows unexpectedly low activity on starting-up or restarting of the process. In addition, benzene production may occur. The invention seeks to minimize contact of the catalyst with alkene at temperature by reducing the alkene partial pressure or the reaction temperature so as to suppress formation of benzene and/or suppress inhibition of the catalyst.

Kitchen describes a process for the production of vinyl acetate. The indicated objective in the Kitchen process is to maintain the oxygen concentration at or near its flammability limit. As noted in the Action, Kitchen also states that the oxygen concentration may be maintained at or below 10 vol% oxygen. However, the term "below 10 vol%" cannot be read in isolation of the rest of the Kitchen disclosure which is

that it is desired to maximize the concentration of oxygen in the outlet and operate with the oxygen concentration as close as possible to the flammability limit of the outlet stream (which is the maximum safe oxygen concentration in the outlet stream).

Based on this, one of ordinary skill would read the statement that the oxygen concentration may be maintained at or below 10 vol% oxygen as that it should be maximized; subject to flammability constraints, whilst being maintained at or below 10 vol%. The skilled person would not read this as encompassing the range "less than 2 vol% oxygen" as required in the presently claimed invention.

In support of this, it is noted that the lowest concentration exemplified in Kitchen is 3.1 vol% (see, Comparative Example A, Table A). It is also noted that this is a comparative example, and the disclosure of Kitchen is that this value is too **low** compared to the flammability limit, and should be increased. This is done in Example 1 of Kitchen to the threshold value of 4 vol% in the reactor outlet.

It is further pointed out that the present invention relates to reaction conditions where an oxygen level at the outlet is obtained which is significantly lower than might be expected under "normal" operating conditions. This is why the claim recites "during a process upset, start-up or shut-down". In particular, a level of 2 vol% oxygen in the outlet stream of a process for production of vinyl acetate is significantly below that which would be expected under "normal" operating conditions.

The statement in the Action that: "For the purposes of this rejection, the Examiner considers the limitation 'the outlet stream comprises less than 2 vol% oxygen' to require that the percentage oxygen in the outlet stream be maintained at greater than 2% by reducing the alkene partial pressure" is not understood. It is not clear what is the

basis for this position but if the Action is suggesting that all feeds other than oxygen should be reduced in order that the oxygen concentration increases to greater than 2 vol% again, this is incorrect. (It is also not clear that an increased oxygen concentration in the outlet would result from reducing all other feed rates. If all other feed rates are reduced this would result in an increased inlet concentration of oxygen, but a lower space velocity over the catalyst which could result in higher conversion of both alkene and oxygen.)

The object of the claimed invention is to reduce the partial pressure of the alkene to minimize the exposure of the catalyst to alkene at low oxygen concentrations. This may result in either an increase or a decrease of the oxygen concentration in the outlet stream. Even if it results in an increase, there is no requirement that the oxygen concentration in the outlet should be increased above 2 vol%.

Although Kitchen refers to the possibility of a reactor shut-down at col. 2, line 49 onwards, as noted in the Action, this is in relation to the situation where the oxygen level exceeds the flammability limit, i.e., is too high. In contrast, the claimed process of the present invention relates to the situation where the oxygen concentration is too low.

Finally, the Action argues that the skilled person, based on Kitchen, would be motivated to adjust the level of oxygen during start-up, shut-down, etc., as well as during normal operation in order to optimize the selectivity. If this were the case, Kitchen would lead the person of ordinary skill to **maximize** the oxygen level in the outlet to maximize selectivity even during start-up. However, the problem of excess oxygen buildup during start-up or restart of the catalyst, because the catalyst has been

inhibited previously, is one of the problems the present invention seeks to avoid, as described in the introduction of the application as originally filed.

Kitchen therefore relates to "normal" operation and describes maximizing oxygen concentration subject to safety (flammability) limits under these conditions. There is no disclosure or suggestion in Kitchen of what to do if a **low** oxygen concentration occurs during a process upset, start-up or shut-down. In contrast, the present invention relates to operation during a process upset, start-up or shut-down in which the outlet stream comprises **low** oxygen levels or **no** oxygen at all, and seeks to minimize contact of the catalyst with alkene at temperature, by either reducing the alkene partial pressure or the reaction temperature.

In light of the above, it is clear that one of ordinary skill would not have been motivated to arrive at the presently claimed process based on Kitchen. Absent any such motivation, a *prima facie* case of obviousness has not been generated in this case. Reconsideration and withdrawal of the outstanding obviousness rejection are accordingly respectfully requested.

Favorable action is awaited.

Respectfully submitted,

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